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CONTINUOUS CHANGES OF SURFACE WATER TEMPERATURES AT THE SUBTROPICAL CONVERGENCE, THE AUSTRALASIAN SUBANTARCTIC FRONT, AND THE ANTARCTIC CONVERGENCE IN THE SOUTHERN OCEAN (EXTENDED ABSTRACT)

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The Subtropical Convergence and Antarctic Convergence that form around Antarctica (DEACON, 1937), and the Australasian Subantarctic Front reported in the Indian Ocean sector (BURING, 1961) are considered to be important in understanding the Southern Ocean's structure—and also as a biological environment.

However, the general concept of these fronts is limited to that expressed in macro scale. The aim of the present report is to study in detail the position of fronts and its variability based on the changes in surface temperature on a regional level.

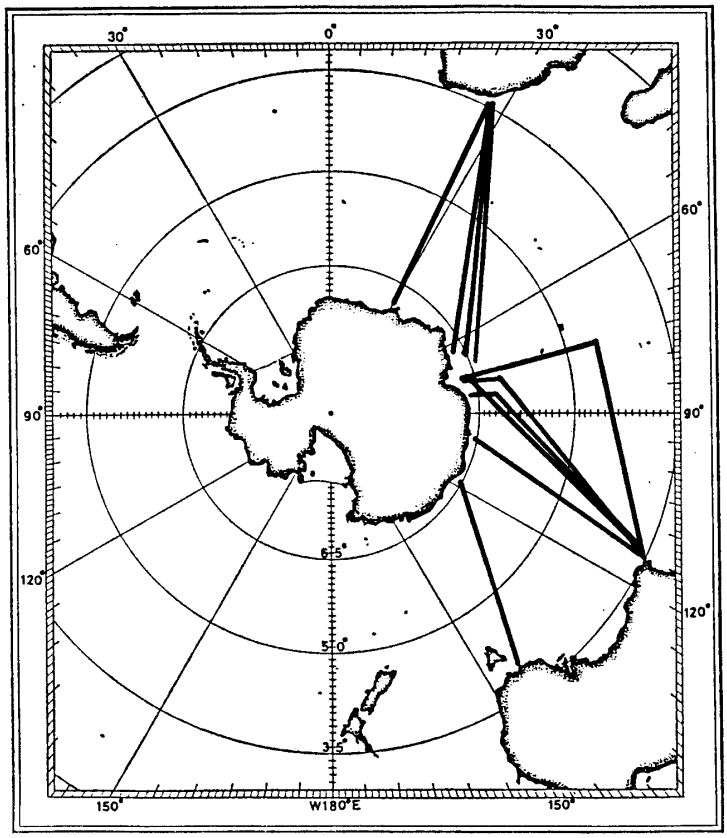

Fig. 1. Observation lines of the KAIYO MARU.

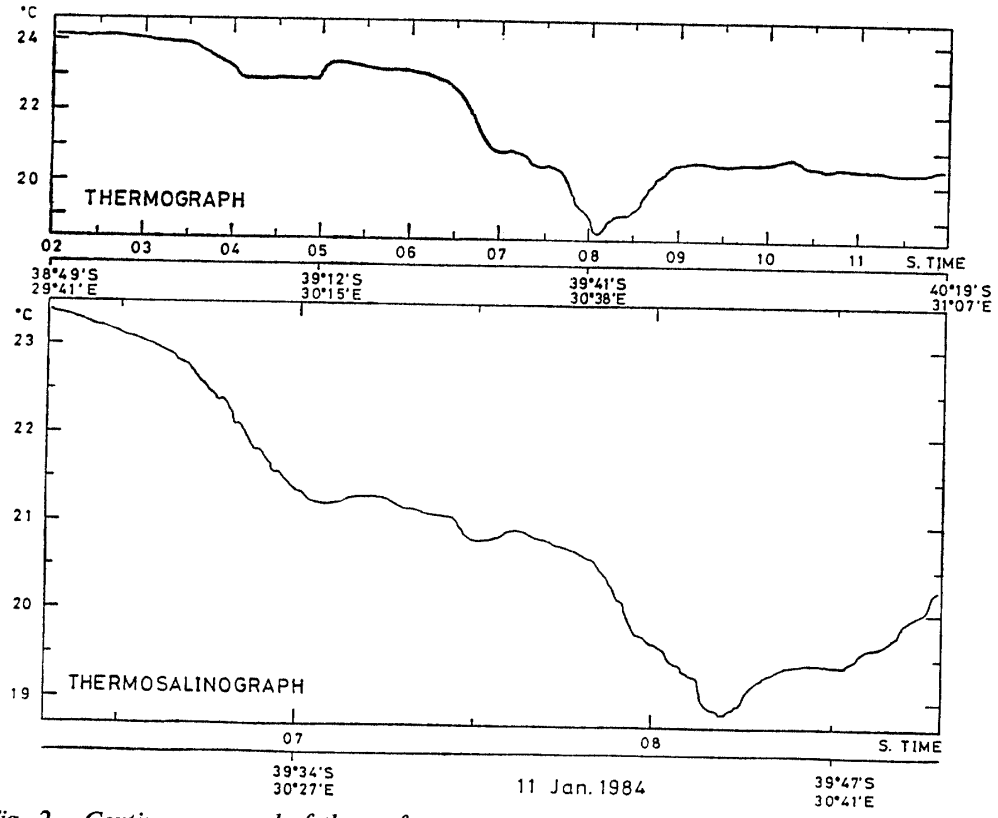

Fig. 2. Continuous record of the surface water temperature at the Subtropical Convergence from Port Elizabeth (South Africa) towards the Antarctic Ocean.

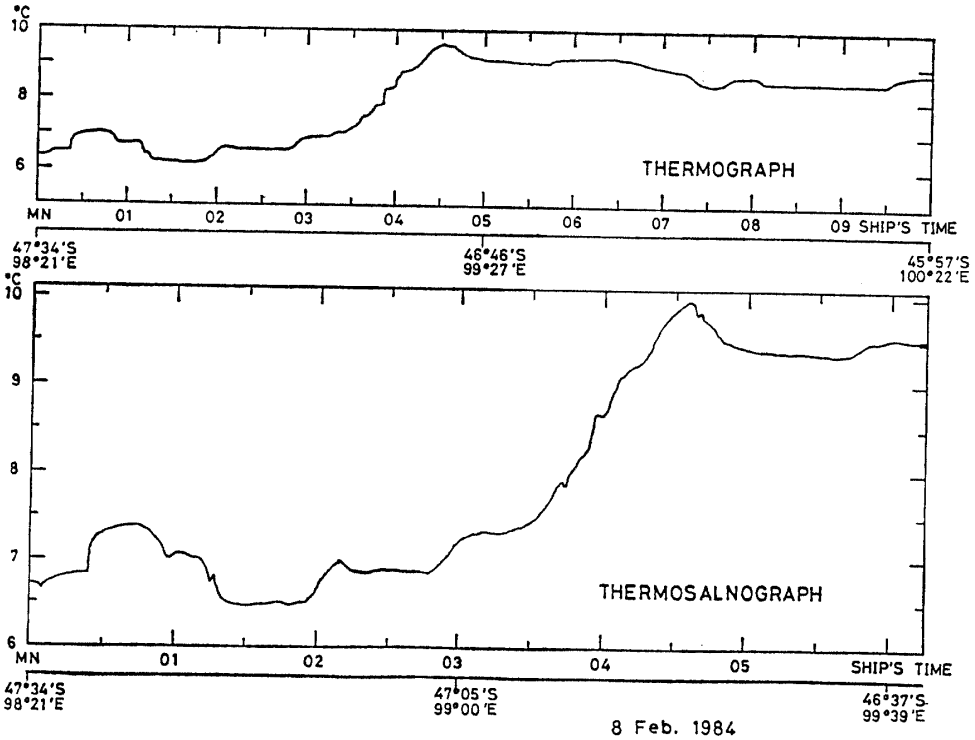

Fig. 3. Continuous record of the surface water temperature at the Australasian Subantarctic Front from the Antarctic Ocean towards Fremantle (Australia).

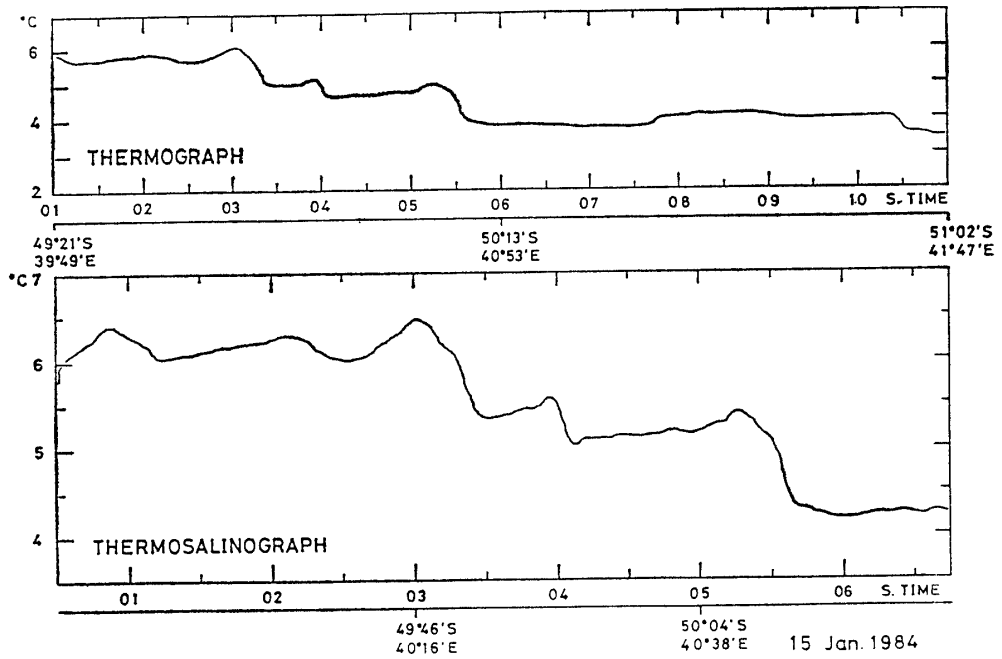

Fig. 4. Continuous record of the surface water temperature at the Antarctic Convergence from Port Elizabeth (South Africa) towards the Antarctic Ocean.

The surface temperature data were collected by the KAIYO MARU (Japan Fisheries Agency) during the BIOMASS project in 1979–80, 1980–81 and 1983–84 (see cruise routes in Fig. 1). The temperature data consist of the XBT observations at each one degree in latitude, and the continuous observation of surface (3–3.5 m depth) water temperature by two thermographs in the Southern Ocean.

The vertical distribution of water temperature measured by XBT gave an approximate position of front, and the thermographs showed that the water temperature gradient is greater than the surrounding area (see examples in Figs. 2, 3, 4). Regional front forms are bands, and layers of bands with a dynamic nature.

References

BURING, R. W. (1961): Hydrology of Circumpolar Waters south of New Zealand. N. Z. Dep. Sci. Ind. Res. Bull., **143**(10), 66 p.

DEACON, G. E. R. (1937): The hydrology of the Southern Ocean. Discovery Rep., **15**, 1–124.

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